

Title (en)  
REFRIGERATION CYCLE DEVICE

Title (de)  
KÄLTEKREISLAUFVORRICHTUNG

Title (fr)  
DISPOSITIF À CYCLE DE RÉFRIGÉRATION

Publication  
**EP 3910262 A4 20211229 (EN)**

Application  
**EP 19908451 A 20190109**

Priority  
JP 2019000356 W 20190109

Abstract (en)  
[origin: EP3910262A1] A refrigeration cycle apparatus (1) of the present invention includes: a refrigerant circuit (2); and refrigerant. The refrigerant circuit (2) includes a compressor (4), a condenser (5), an expansion valve (6), an evaporator (7), and an internal heat exchanger (8). The refrigerant is a hydrocarbon refrigerant. The internal heat exchanger (8) includes: an inner pipe (8a); and an outer pipe (8b). The internal heat exchanger (8) is configured to cause heat exchange between the refrigerant flowing inside the inner pipe (8a) in a direction from the condenser (5) toward the expansion valve (6), and the refrigerant flowing inside the outer pipe (8b) and outside the inner pipe (8a) in a direction from the evaporator (7) toward the compressor (4). The refrigerant flowing inside the outer pipe (8b) and outside the inner pipe (8a) is entirely gas.

IPC 8 full level  
**F25B 1/00** (2006.01); **F25B 40/02** (2006.01); **F25B 40/06** (2006.01); **F28D 7/10** (2006.01); **F28F 13/00** (2006.01)

CPC (source: EP)  
**F25B 1/00** (2013.01); **F25B 40/02** (2013.01); **F25B 40/06** (2013.01); **F28D 7/106** (2013.01); **F28F 1/40** (2013.01); **F28F 13/187** (2013.01); **F25B 2400/054** (2013.01); **F25B 2500/09** (2013.01); **F28D 2021/0068** (2013.01)

Citation (search report)  
• [XYI] KR 200420568 Y1 20060704  
• [XI] DE 102013201313 A1 20130829 - FORD GLOBAL TECH LLC [US]  
• [I] DE 19944951 A1 20010322 - BEHR GMBH & CO [DE]  
• [YD] JP 2008164245 A 20080717 - KOBELCO & MAT COPPER TUBE INC  
• [A] US 2010326640 A1 20101230 - HIGASHIYAMA NAOHISA [JP], et al  
• See also references of WO 2020144764A1

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)  
BA ME

DOCDB simple family (publication)  
**EP 3910262 A1 20211117**; **EP 3910262 A4 20211229**; CN 113227672 A 20210806; JP 7460550 B2 20240402; JP WO2020144764 A1 20210930; WO 2020144764 A1 20200716

DOCDB simple family (application)  
**EP 19908451 A 20190109**; CN 201980079923 A 20190109; JP 2019000356 W 20190109; JP 2020565068 A 20190109